PROGRAMME OUTCOME

Based on the B. Pharmacy, M. Pharmacy and Pharm D program's educational objectives, students will achieve the following specific program outcomes.

PO-01 Pharmacy Knowledge: Possess knowledge and comprehension of the core and basic knowledge associated with the profession of pharmacy, including biomedical sciences; pharmaceutical sciences; behavioral, social, and administrative pharmacy sciences; and manufacturing practices.

PO-02 Planning Abilities: Demonstrate effective planning abilities including time management, resource management, delegation skills and organizational skills. Develop and implement plans and organize work to meet deadlines.

PO-03 Problem analysis: Utilize the principles of scientific enquiry, thinking analytically, clearly and critically, while solving problems and making decisions during daily practice. Find, analyze, evaluate and apply information systematically and shall make defensible decisions.

PO-04 Modern tool usage: Learn, select, and apply appropriate methods and procedures, resources, and modern pharmacy-related computing tools with an understanding of the limitations.

PO-05 Leadership skills: Understand and consider the human reaction to change, motivation issues, leadership and team-building when planning changes required for fulfillment of practice, professional and societal responsibilities. Assume participatory roles as responsible citizens or leadership roles when appropriate to facilitate improvement in health and well-being.

PO-06 Professional Identity: Understand, analyze and communicate the value of their professional roles in society (e.g. health care professionals, promoters of health, educators, managers, employers, employees).

PO-07 Pharmaceutical Ethics: Honour personal values and apply ethical principles in professional and social contexts. Demonstrate behavior that recognizes cultural and personal variability in values, communication and lifestyles. Use ethical frameworks; apply ethical principles while making decisions and take responsibility for the outcomes associated with the decisions.

PO-08 Communication: Communicate effectively with the pharmacy community and with society at large, such as, being able to comprehend and write effective reports, make effective presentations and documentation, and give and receive clear instructions.

PO-09 The Pharmacist and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety and legal issues and the consequent responsibilities relevant to the professional pharmacy practice.

PO-10 Environment and sustainability: Understand the impact of the professional pharmacy solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO-11 Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change. Self-assess and use feedback effectively from others to identify learning needs and to satisfy these needs on an ongoing basis.

PO-12 Expertise in subject: M. Pharmacy program helps to develop expertise in particular subject in pharmacy profession. Pharmaceutics specialization helps to get expertise in formulation development, Pharmacology specialization makes student expert in understanding the mechanism of action of drugs and the various biological event occurring in body while Pharmaceutical Chemistry specialization helps to understand the concept of synthesis of drugs. The Pharm D course provides the depth knowledge of clinical pharmacy to the students.

COURSE OUTCOME:

The course outcomes are prepared for each course (each subject) after giving due consideration to the syllabus prescribed by the Osmania University. The syllabus did not prescribe learning outcomes, but each teacher attempts to formulate the course outcomes. The following course outcomes for each course in the B. Pharmacy program is given in Table

COURSE OUTCOMES

COURSE AND YEAR/ SEM	COURSE CODE	SUBJECT	COURSE OUTCOME
B. PHARM FIRST SEMESTER	BP101 T	Human Anatomy and Physiology-I	• To explain the gross morphology • Structure and functions of various organs of the human body. • Identify the various tissues and organs of different systems of human body.
	BP102 T	Pharmaceutical Analysis −I	• To understand the principles of volumetric and electro chemical analysis. • To carry out various volumetric and electrochemical titrations • To develop analytical skill.
	BP103 T	Pharmaceutics I	• To know the history of profession of pharmacy. • Understand the basics of different dosage forms,

B PHARM SECOND SEMESTER			• To understand the professional way of handling the prescription
	BP104 T	Pharmaceutical Inorganic Chemistry	• To know the sources of impurities and methods to determine the impurities in inorganic drugs and pharmaceuticals. • To understand the medicinal and pharmaceutical importance of inorganic compounds. • To know the preparation and assay methods of inorganic compounds.
	BP105 T	Communication skills	• This course will prepare the young pharmacy student to interact effectively with doctors, nurses, dentists, physiotherapists and other

			health workers. • To know how to face interviews after completion of the course. • To improve communication skills of students.
	BP106 RBT/ BP106 RMT	Remedial Biology/ Mathematics−	• To solve the different types of problems by applying theory & appreciate the important application of mathematics in Pharmacy. • To learn and understand the components of living world. • To learn structure and functional system of plant and animal kingdom.
	BP201 T	Human Anatomy and Physiology II	• This subject is designed to impart fundamental knowledge on the structure of human body

			• To know the functions of the various systems of the human body. • It also helps in understanding both homeostatic mechanisms.
	BP202 T	Pharmaceutical Organic Chemistry I	• To write the structure, name and the type of isomerism of the organic compound. • To study preparation and reactions of hydrocarbons. • To write the reaction, name the reaction and orientation of reactions.
	BP203 T	Biochemistry	• The subject is providing biochemical facts and the principles to understand metabolism of nutrient molecules in physiological and pathological conditions.

			• To study the cycles of metabolism • To learn biochemical reactions
	BP204 T	Pathophysiology	• This course is designed to impart a thorough knowledge of the relevant aspects of pathology of various conditions with reference to its pharmacologic al applications, • To study the effects of diseases
	BP205 T	Computer Applications in pharmacy	• To know the various types of application of computers in pharmacy • To know the various applications of databases in pharmacy.
	BP206 T	Environmental sciences	• To create the awareness about environmental problems among learners. • Impart basic knowledge

			about the environment and its allied problems. • Develop an attitude of concern for the environment
B PHARM THIRD SEMESTER	BP301 T	Pharmaceutical Organic Chemistry II	• Student shall be able to write the structure, name and the type of isomerism of the organic compound. • Write the reaction, name the reaction and orientation of reactions • Account for reactivity/stability of compounds.
	BP302 T	Physical Pharmaceutics I	• Theory and practical components of the subject help the student to get a better insight in to various areas of formulation research and development. • Stability studies of pharmaceuticals.

			• Some physicochemical properties of the drug.
	BP303T	Pharmaceutical Microbiology	• To understand methods of identification, cultivation and preservation of various microorganisms. • The importance of sterilization in microbiology. • To know the sterilization techniques.
	BP304T	Pharmaceutical Engineering	• To know various unit operations used in Pharmaceutical industries. • To understand the material handling techniques. • To perform various processes involved in pharmaceutical manufacturing process.
	BP401T	Pharmaceutical Organic Chemistry III	• The student shall be able to understand the methods of preparation and properties of

B PHARM FOURTH SEMESTER			organic compounds • Explain the stereo chemical aspects of organic compounds and stereo chemical reaction. • know the medicinal uses and other applications of organic compounds.
	BP402 T	Medicinal Chemistry I	• To understand the chemistry of drugs with respect to their pharmacological activity. • Understand the drug metabolic pathways, adverse effects. • Therapeutic value of drugs. • MOA of the drugs. • SAR of the drugs.
	BP403 T	Physical Pharmaceutics II	• Theory and practical components of the subject help the student to get a better insight in to various areas of formulation

			research and development. • Stability studies of pharmaceuticals. • Physicochemical properties of the drug.
	BP404T	Pharmacology I	• The subject covers the information about the drugs like mechanism of action. • Pharmacodynamics of the drugs • Pharmacokinetics of the drug along with the adverse effects. • Clinical uses, and routes of administration of different classes of drugs.
	BP405T	Pharmacognosy and Phytochemistry I	• To know the techniques in the cultivation and production of crude drugs. • To know the crude drugs, their uses and chemical nature. • To know the evaluation

			techniques for the herbal drug.
B PHARM FIFTH SEMESTER	BP501 T	Medicinal Chemistry-II	• This subject is designed to impart fundamental knowledge on the structure, • Chemistry and therapeutic value of drugs. • The subject emphasizes on structure activity relationships of drugs. • Importance of physicochemical properties and metabolism of drugs.
	BP502 T	Industrial Pharmacy I	• To know the various pharmaceutical dosage forms and their manufacturing techniques. • Know various considerations in development of pharmaceutical dosage forms. • Formulate solid, liquid and semisolid dosage forms and evaluate

			them for their quality.
	BP503 T	Pharmacology-II	• This subject is intended to impart the fundamental knowledge on various aspects of drugs acting on different systems of body. • In addition, emphasis on the basic concepts of bioassay. • Know the bioassay procedures.
	BP504 T	Pharmacognosy and Phytochemistry II−	• To impart the students, the knowledge of how the secondary metabolites are produced in the crude drugs. • How to isolate and identify and produce them industrially. • To know the uses of herbal drugs.
	BP505 T	Pharmaceutical Jurisprudence	• To impart basic knowledge on several important legislations

			related to the profession of pharmacy in India. • To know the acts in pharmacy • To know the schedules of the drugs.
B PHARM SIXTH SEMESTER	BP601 T	Medicinal Chemistry III	• To understand the importance of drug design and different techniques of drug design. • Understand the chemistry of drugs with respect to their biological activity. • Know the metabolism, adverse effects and therapeutic value of drugs.
	BP602 T	Pharmacology III	• To understand the mechanism of drug action and its relevance in the treatment of different infectious diseases comprehend the principles of toxicology. • Treatment of various

			poisonings and appreciate correlation of pharmacology with related medical sciences.
	BP603 T	Herbal Drug Technology	• This subject gives the student the knowledge of basic understanding of herbal drug industry. • Know the quality of raw material • Guidelines for quality of herbal drugs, herbal cosmetics, natural sweeteners, nutraceuticals etc.
	BP604 T	Biopharmaceutics and Pharmacokinetics	• This subject is designed to impart knowledge and skills necessary for dose calculations. • Dose adjustments and to apply Biopharmaceutics. • Theories in practical

			problem solving.
	BP605 T	Pharmaceutical Biotechnology	• To understanding the importance of Immobilized enzymes in Pharmaceutical Industries. • Genetic engineering applications in relation to production of pharmaceuticals.
	BP606 T	Quality Assurance	• This course deals with the various aspects of quality control and quality assurance aspects of pharmaceutical industries. • It covers the important aspects like cGMP, QC tests, documentation, quality certifications and regulatory affairs.
	BP701 T	Instrumental Methods of Analysis	• To understand the interaction of matter with electromagnetic radiations

B PHARM SEVENTH SEMESTER			• To learn applications in drug analysis by instruments. • To know structural data.
	BP702 T	Industrial Pharmacy - II	• This course is designed to impart fundamental knowledge on pharmaceutical product commercialization from laboratory to market
	BP703 T	Pharmacy Practice	• The students are required to learn various skills like drug distribution, drug information. • Therapeutic drug monitoring for improved patient care.
	BP704 T	Novel Drug Delivery System	• To understand various approaches for development of novel drug delivery systems. • To understand the criteria for development of novel drug delivery systems their

			formulation and evaluation.
B PHARM EIGHTTH SEMESTER	BP801 T	Biostatistics and Research Methodology	• To understand how to select a research topic in his/her areas of interest. • The fundamentals of collecting, analyzing and interpreting the relevant data. • Different computational methods and software‘s facilitating research.
	BP802 T	Social and Preventive Pharmacy	• The purpose of this course is to introduce to students a number of health issues and their challenges. • This course also introduced a number of national health programmes. • The roles of the pharmacist in these contexts are also discussed.
	BP803 ET	Pharma Marketing management	• The course aim is to provide an understanding

			of marketing concepts and techniques. • Application of the same in the pharmaceutical Industry. • To know the pharma management skills.
	BP804 ET	Pharmaceutical Regulatory Science	• Fundamental knowledge on the regulatory requirements for approval of new drugs, drug products in regulated countries like US, EU, Japan, Australia and Canada. • It prepares the students to learn in detail on the regulatory requirements, documentation requirements. • Registration pr ocedures for marketing the drug products in regulated countries.
	BP805 ET	Pharmacovigilance	• This paper will provide an opportunity for the student to learn about

			development of pharmacovigilance as a science • Basic terminologies used in pharmacovigilance, global scenario of pharmacovigilance. • Train students on establishing pharmacovigilance program in an organization, various methods that can be used to generate safety data and signal detection.
	BP806 ET	Quality Control and Standardizations of Herbals	• In this subject the student learns about the various methods and guidelines for evaluation and standardization of herbs and herbal drugs. • The subject also provides an opportunity for the student to learn cGMP, GAP and GLP in traditional system of medicines.

	BP807 ET	Computer Aided Drug Design	• This subject is designed to provide detailed knowledge of rational drug design process. • Various techni ques used in rational drug design process.
	BP808 ET	Cell and Molecular Biology	• The course content will equip the students with adequate knowledge of the molecular process occurring within the cell and possibly pharmacologica l interventions into those Processes
	BP809 ET	Cosmetic Science	• To Know the cosmetic principles to address the needs of cosmetic industry. • Understand formulation science and analytical techniques required to scientifically design and develop

			cosmetic products. • Explain the scientific and technical aspects, high standards of practice and professional ethics within the cosmetic and toiletries industry.
	BP810 ET	Experimental Pharmacology	• This subject is designed to impart the basic knowledge of preclinical studies in experimental animals including design, conduct and interpretations of results.
	BP811 ET	Advanced Instrumentation Techniques	• This subject deals with the application of instrumental methods in qualitative and quantitative analysis of drugs. • This subject is designed to impart advanced knowledge on the principles and

			instrumentation of spectroscopic and chromatographic hyphenated techniques. • This also emphasizes on theoretical and practical knowledge on modern analytical instruments that are used for drug testing.
	BP812 ET	Dietary Supplements and Nutraceuticals	• This subject deals with the study of dietary source and supplements. • Study of nutraceuticals
	BP813 PW	Project work	• Research work in various subjects to know the novelty.
PHARM D FIRST YEAR	1.1	Human Anatomy and Physiology	• This course is designed to impart a fundamental knowledge on the structure and functions of the human body. • It also helps in understanding both

			homeostasis mechanisms and homeostatic imbalances of various body systems.
	1.2	Pharmaceutics	• This course is designed to impart a fundamental knowledge on the art and science of formulating different dosage forms. • It prepares the students for the most basic of the applied field of pharmacy. • Students able learn preparation of different dosage forms.
	1.3	Medicinal Biochemistry	• To understands the catalytic activity of enzymes and importance of isoenzymes in diagnosis of diseases; • knows the metabolic process of biomolecules in health and illness

			(metabolic disorders). • Understand the genetic organization of mammalian genome; protein synthesis; replication; mutation and repair mechanism.
	1.4	Pharmaceutical Organic Chemistry	• This course is designed to impart a very good knowledge about a) IUPAC/Common system of nomenclature of simple organic compounds belonging to different classes of organic compounds; • Some important physical properties of organic compounds. • Some important chemical properties of organic compounds.

	1.5	Pharmaceutical Inorganic Chemistry	• To understand the principles and procedures of analysis of drugs and also regarding the application of inorganic pharmaceuticals. • know the analysis of the inorganic pharmaceuticals their applications • Appreciate the importance of inorganic pharmaceuticals in preventing and curing the disease.
	1.6	Remedial Mathematics/ Biology	• Know Trigonometry, Analytical geometry, Matrices, Determinant, Integration, Differential equation, Laplace transform and their applications. • Solve the problems of different types by applying theory.

			• Appreciate the important applications of mathematics in pharmacy. • This subject has been introducing to the pharmacy course in order to make the student aware of various naturally occurring drugs and its history, sources, classification, distribution and the characters of the plants and animals. • This subject gives basic foundation to Pharmacognosy
PHARM D SECOND YEAR	2.1	Pathophysiology	• To describe the etiology and pathogenesis of the selected disease states. • Name the signs and symptoms of the diseases. • Mention the complications of the diseases.
	2.2	Pharmaceutical Microbiology	• To identification, growth factors

			and sterilization of microorganisms. • know the mode of transmission of disease causing microorganism, symptoms of disease, and treatment aspect. • Do estimation of RNA and DNA and there by identifying the source;
	2.3	Pharmacognosy & Phytopharmaceuticals	• Understand the basic principles of cultivation, collection and storage of crude drugs; • know the source, active constituents and uses of crude drugs; • Appreciate the applications of primary and secondary metabolites of the plant.
	2.4	Pharmacology-I	• Understand the pharmacological aspects of drugs falling under the above

			mentioned chapters; • Handle and carry out the animal experiments; • Appreciate the importance of pharmacology subject as a basis of therapeutics; • Correlate and apply the knowledge therapeutically.
	2.5	Community Pharmacy	• knows pharmaceutical care services; • know the business and professional practice management skills in community pharmacies; • do patient counselling & provide health screening services to public in community pharmacy; • Respond to minor ailments and provide appropriate medication;

	2.6	Pharmacotherapeutics-I	• The pathophysiology of selected disease states and the rationale for drug therapy; • The therapeutic approach to management of these diseases; • The controversies in drug therapy; • The importance of preparation of individualized therapeutic plans based on diagnosis.
PHARM D THIRD YEAR	3.1	Pharmacology-II	• Understand the pharmacological aspects of drugs falling under the above mentioned chapters, • carries out the animal experiments confidently. • Appreciates the importance of pharmacology subject as a basis of therapeutics. • Correlate and apply the

			knowledge therapeutically.
	3.2	Pharmaceutical Analysis	• To understand chromatography, spectroscopy. • To analysis of crude drugs and dosage forms by using instruments. • Analysis of spectral data.
	3.3	Pharmacotherapeutics-II	• know the pathophysiology of selected disease states and the rationale for drug therapy. • know the therapeutic approach to management of these diseases. • know the controversies in drug therapy. • know the importance of preparation of individualized therapeutic plans based on diagnosis.
	3.4	Pharmaceutical Jurisprudence	• Practice the Professional ethics. • Understand the various

			concepts of the pharmaceutical legislation in India. • know the various parameters in the Drug and Cosmetic Act and rules;
	3.5	Medicinal Chemistry	• Modern concept of rational drug design • Brief introduction to Quantitative Structure Activity Relationship (QSAR). • Study of Prodrug,combinatorial chemistry and computer aided drug design.
	3.6	Pharmaceutical Formulations	• Understand the principle involved in formulation of various pharmaceutical dosage forms. • prepare various pharmaceutical formulation; • Perform evaluation of pharmaceutical dosage forms

PHARM FOURTH YEAR	4.1	Pharmacotherapeutics-III	• The pathophysiology of selected disease states and the rationale for drug therapy; • The therapeutic approach to management of these diseases; • The controversies in drug therapy
	4.2	Hospital Pharmacy	• Know various drug distribution methods; • Know the professional practice management skills in hospital pharmacies; • Provide unbiased drug information to the doctors;
	4.3	Clinical Pharmacy	• Monitor drug therapy of patient through medication chart review and clinical review; • Obtain medication history interview and counsel the patients;

			• Identify and resolve drug related problems; • Detect, assess and monitor adverse drug reaction.
	4.4	Biostatistics & Research Methodology	• Types of clinical study designs: Case studies, observational studies, interventional studies, • Designing the methodology c. Sample size determination and Power of a study Determination of sample size for simple comparative experiments. • Determination of sample size to obtain a confidence interval of specified width, power of a study.
	4.5	Biopharmaceutics & Pharmacokinetics	• This subject is designed to impart knowledge and skills necessary for dose calculations.

			• Dose Adjustments and to apply Biopharmaceutics theories in practical problem solving.
	4.6	Clinical Toxicology	• General principles involved in the management of poisoning. • Antidotes and the clinical applications. • Supportive care in clinical Toxicology. • Gut Decontamination.
PHARM D FIFTH YEAR	5.1	Clinical research	• To study clinical development & processes of drugs.
	5.2	Pharmacoepidemiology and pharmacoeconomics	• Origin and evaluation of pharmacoepidemiology need for pharmacoepidemiology, • aims and applications.
	5.3	Clinical pharmacokinetics and therapeutic drug monitoring	• Nomograms and Tabulations in designing dosage regimen.

			• Conversion from intravenous to oral dosing. • Determination of dose and dosing intervals, Drug dosing in the elderly and pediatrics and obese patients
PHARM D SIXTH YEAR	-	Internship	• Students able to do Case studies.
PHARM D PB FIRST YEAR	4.1	PHARMACOTHERAPEUTICS I & II	• The pathophysiology of selected disease states and the rationale for drug therapy and therapeutic approach to management of these diseases. • The importance of preparation of individualized therapeutic plans based on diagnosis. • Needs to identify the patient-specific parameters relevant in initiating drug therapy.

	4.2	PHARMACOTHERAPEUTICS III	• The therapeutic approach to management of these diseases. The controversies in drug therapy. • It describes the pathophysiology of selected disease states and explain the rationale for drug therapy. • To summarize the therapeutic approach to management of these diseases including reference to the latest available evidence.
	4.3	HOSPITAL PHARMACY	• To know various drug distribution methods and to know the professional practice management skills in hospital pharmacies. • To provide unbiased drug information to the doctors and to know the manufacturing practices of various

			formulations in hospital set up. • The practice based research methods appreciate the stores management and inventory control.
	4.4	CLINICAL PHARMACY	• To monitor drug therapy of patient through medication chart review and clinical review. • To obtain medication history interview and counsel the patients. • To identify and resolve drug related problems and to detect, assess and monitor adverse drug reaction.
	4.5	BIOSTATISTICS AND RESEARCH METHODOLOGY	• Types of clinical study designs: Case studies, observational studies, interventional studies. • Designing the methodology. Sample size determination

			and Power of a study. • Determination of sample size for simple comparative experiments, determination of sample size to obtain a confidence interval of specified width, power of a study.
PHARM D(PB) FIFTH YEAR	5.1	Clinical Research	• Drug development process • phases of clinical development of drug.
	5.2	Pharmacoepidemiology and Pharmacoeconomics	• Measurement of outcomes in pharmacoepidemiology • Pharmacoepidemiological methods.
	5.3	Clinical Pharmacokinetics & Pharmacotherapeutic Drug Monitoring	• Design of dosage regimens Pharmacokinetics of Drug Interaction. • Therapeutic Drug monitoring

PHARM D(PB) SIXTH YEAR	-	Internship	• Students able to do Case studies.
M PHARM FIRST SEMESTE(PHARM.CHEMISTRY)	MPC101T	Modern Pharmaceutical Analytical Techniques	• The analysis of various drugs in single and combination dosage forms • Theoretical knowledge of instruments • Practical applications of instruments.
	MPC102T	Advanced Organic Chemistry –I	• The principles and applications of retrosynthesis. • The mechanism & applications of various named reactions. • The concept of disconnection to develop synthetic routes for small target molecule. • The various catalysts used in organic reactions.
	MPC103T	Advanced Medicinal Chemistry	• Different stages of drug discovery. • Role of medicinal chemistry in drug research.

			• Different techniques for drug discovery. • Various strategies to design and develop new drug like molecules for biological targets Peptidomimetics
	MPC104T	Chemistry of Natural Products	• Different types of natural compounds and their chemistry and medicinal importance • The importance of natural compounds as lead molecules for new drug discovery • The concept of rDNA technology tool for new drug discovery • General methods of structural elucidation of compounds of natural origin.
	MPC201T	Advanced Spectral Analysis	• Interpretation of the NMR, Mass and IR spectra of various

M.PHARM SECOND SEMESTER(PHARM.CHEMISTRY)			organic compounds • Theoretical and practical skills of the hyphenated instruments • Identification of organic compounds
	MPC202T	Advanced Organic Chemistry –I	• The principles and applications of Green chemistry • The concept of peptide chemistry. • The various catalysts used in organic reactions • The concept of stereochemistry and asymmetric synthesis.
	MPC203T	Computer Aided Drug Design	• Role of CADD in drug discovery • Different CADD techniques and their applications • Various strategies to design and develop new drug like molecules. • Working with molecular

			modeling softwares to design new drug molecules.
	MPC204T	Pharmaceutical Process Chemistry	• The strategies of scale up process of APIs and intermediates • The various unit operations and various reactions in process chemistry
THIRD SEMESTER (PHARM.CHEMISTRY)	MRM301T	Research Methodology and Biostatistics	• General Research Methodology: Research, objective, requirements, practical difficulties, • Review of literature. • Study designs and details of Biostatistical analysis
FOURTH SEMESTER(PHARM.CHEMISTRY)	-	RESEARCH WORK	• Students able to do research work in particular specialization with novelty.

M PHARM FIRST SEMESTER (PHARMACOLOGY)	MPL 101T	Modern Pharmaceutical Analytical Techniques	• Student is able to know about, Chemicals and Excipients • The analysis of various drugs in single and combination dosage forms • Theoretical and practical skills of the instruments.
	MPL102T	Advanced Pharmacology-I	• Student shall be able to Discuss the pathophysiology and pharmacotherapy of certain diseases • Explain the mechanism of Drug actions at cellular and molecular level • Understand the adverse effects, contraindications and clinical uses of drugs used in treatment of diseases.
	MPL103T	Pharmacological and Toxicological Screening Methods-I	• Appraise the regulations and ethical requirement for the usage of

			experimental animals. • Describe the various animals used in the drug discovery process and good laboratory practices in maintenance and handling of experimental animals Describe the various newer screening methods involved in the drug discovery process.
	MPL104T	Cellular and Molecular Pharmacology	• Explain the receptor signal transduction processes. • Explain the molecular pathways affected by drugs. • Appreciate the applicability of molecular pharmacology and biomarkers in drug discovery process.
M PHARM SECOND SEMESTER (PHARMACOLOGY)	MPL201T	Advanced Pharmacology II	• Explain the mechanism of drug actions at cellular and molecular level

			• Discuss the Pathophysiology and pharmacotherapy of certain diseases • Understand the adverse effects, contraindications and clinical uses of drugs used in treatment of diseases.
	MPL202T	Pharmacological and Toxicological Screening Methods – II	• Explain the various types of toxicity studies. • Appreciate the importance of ethical and regulatory requirements for toxicity studies. • Demonstrate the practical skills required to conduct the preclinical toxicity studies.
	MPL203T	Principles of Drug Discovery	• Explain the various stages of drug discovery. • Appreciate the importance of the role of genomics, proteomics and bioinformatics

			in drug discovery Explain various targets for drug discovery
	MPL203T	Experimental pharmacology	Experimental studies by using software.
M PHARM THIRD SEMESTER (PHARMACOLOGY)	MRM301T	Research Methodology and Biostatistics*	• General Research Methodology: • Research, objective, requirements, practical difficulties, review of literature • Study of design, Biostatistics
M PHARM FOURTH SEMESTER(PHARMACOLOGY)	-	RESEARCH WORK	• Students able to do research work in particular specialization with novelty.
M PHARM FIRST SEMESTER (PHARMACEUTICS)	MPH101T	Drug Delivery Systems	• Drug delivery system give a detailed information transporting a pharmaceutical compound in the body as needed to safely achieve its desired therapeutic effect.

			• Also it refers to approaches, formulations, technologies, and systems for transporting a pharmaceutical compound in the body as needed to safely achieve its desired therapeutic effect with suitable drug delivery. • Vaccine delivery and different mode of application approach for clinical use.
	MPH102T		• They know the different types of Drug carrier used in the process of drug delivery which serves to improve the selectivity, effectiveness, and/or safety of drug administration. • The students will know the latest drug delivery knowledge and think to develop new formulation

			based on the individual Requirement. Recent developments in protein and peptide for parenteral delivery approaches will give new dimension of drug deliver for antibiotics, insulin, etc.
	MPH103T	Modern Pharmaceutics	• Basics of medical devices and IVDs, process of development, ethical and quality considerations harmonization initiatives for approval and marketing of medical devices and IVDs regulatory approval process for medical devices and IVDs in India, US, Canada, EU, Japan and ASEAN clinical evaluation and investigation of medical devices and IVDs.

	MPH104T	Regulatory Affairs	• The Concepts of innovator and generic drugs, drug development process • The Regulatory guidance's and guidelines for filing and approval process Preparation of Dossiers and their submission to regulatory agencies in different countries • Post approval regulatory requirements for actives and drug products Submission of global documents in CTD/ eCTD formats • Clinical trials requirements for approvals for conducting clinical trials Pharmacovigilance and process of monitoring in clinical trials

M PHARM SECOND SEMESTER (PHARMACEUTICS)	MPH201T	Molecular Pharmaceutics (Nano Tech and targeted DDS)	• The various approaches for development of novel drug delivery systems. • The criteria for selection of drugs and polymers for the development of NTDS The formulation and evaluation of novel drug delivery systems.
	MPH202T	Advanced Biopharmaceutics and pharmacokinetics	• The basic concepts in biopharmaceutics and pharmacokinetics. • The use raw data and derive the pharmacokinetic models and parameters the best describe the process of drug absorption, distribution, metabolism and elimination. The critical evaluation of biopharmaceutical studies involving drug

			product equivalency. • The design and evaluation of dosage regimens of the drugs using pharmacokinetic and biopharmaceutical parameters. The potential clinical pharmacokinetic problems and application of basics of pharmacokinetic
	MPH203T	Computer Aided drug delivery System	• History of Computers in Pharmaceutical Research and Development • Computational Modeling of Drug Disposition • Computers in Preclinical Development • Optimization Techniques in Pharmaceutical Formulation • Computers in Market Analysis • Computers in Clinical Development

			• Artificial Intelligence (AI) and Robotics Computational fluid dynamics(CFD)
	MPH204T	Cosmetics and Cosmeceuticals	• Key ingredients used in cosmetics and cosmeceuticals . • Key building blocks for various formulations. • Various key ingredients and basic science to develop cosmetics and cosmeceuticals Scientific knowledge to develop cosmetics and with desired Safety, stability, and efficacy.
THIRD SEMESTER(PHARMACEUTICS)	MRM301T	Research Methodology and Biostatistics*	• General Research Methodology: Research, objective, requirements, practical difficulties. • Review of literature • Study design Biostatistics

FOURTH SEMESTER(PHARMACEUTICS)	-	RESEARCH WORK	• Students able to do research work in particular specialization with novelty